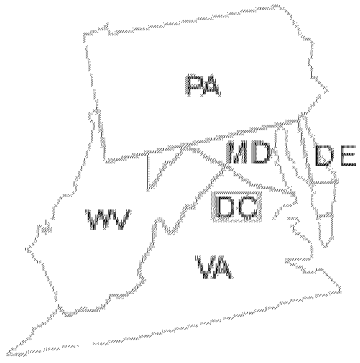
Region 3 (Mid-Atlantic)

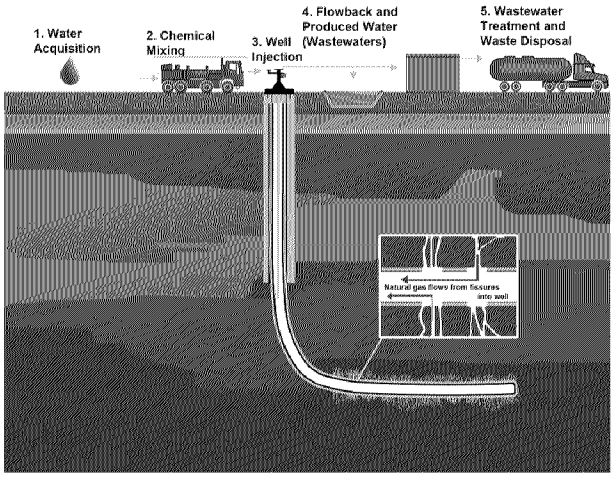


Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

Developing New Analytical Capabilities to Assess Impacts on Drinking Water from Hydraulic Fracturing

EPA Priority 3 - Assuring the Safety of Chemicals
EPA Priority 4 - Cleaning up Our Communities
EPA Priority 5 - Protecting America's Waters

Hydraulic fracturing ("Fracking") has become increasingly prevalent as a method of extracting energy from unconventional reservoirs such as coalbeds, shales, and tight sands. One concern that has been identified with fracking is the potential for chemicals used during the hydraulic fracturing process to enter surface waters or groundwater aquifers that may be used as drinking water sources.



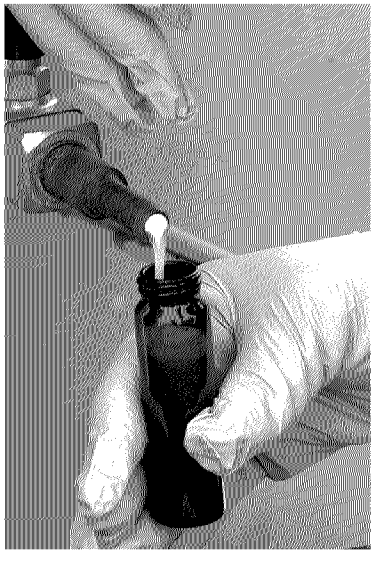
http://www2.epa.gov/hfstudy/hydraulic-fracturing-water-cycle

In 2011, EPA/ORD initiated a research program entitled *Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources.* The study's goal is to assess the impacts of hydraulic fracturing on drinking water resources and identify factors that may affect the severity and frequency of impacts. Five fracking sites were identified for retrospective case studies. The sites are location in Regions 3, 6, and 8 and represent a wide range shale formations and fracking activities.

Of special importance to the study are a group of chemicals commonly found in fracturing fluids called glycols and glycol ethers. Because they are relatively stable, not naturally occurring and some are considered toxic; they may serve as reliable indicators of contamination from hydraulic fracturing activities.

Prior to the start of this study, standard analytical methods for this suite of compounds were either nonexistent or had detection limits that were too high for the intended data quality objectives. In response to this concern, analytical chemists at the US EPA Region 3 Environmental Science Center in Fort Meade, MD developed a robust HPLC/MS/MS (High Performance Liquid Chromatography/Tandem Mass Spectrometry) method for the rapid identification and quantitation of 5 glycols and glycol ethers commonly found in fracking fluid mixes: diethylene glycol, triethylene glycol, tetraethylene glycol, 2-butoxyethanol and 2-methoxyethanol.

Between 2011 and 2013, to support the *ORD Study of the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources,* the Region 3 lab analyzed over 500 water samples from homeowner wells, monitoring wells and production wells, from the 5 retrospective study sites along with water samples from two regional sites.



The Region 3 lab is currently assisting other ORD and Regional labs in establishing this analytical capability as part of a multi-laboratory validation study. This study is in the second phase of validation and is slated to be a published method.

DIM0295042